



Status of the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1-20 (cancelled)

21. (new) A system for producing a pulse code modulation (PCM) signal, comprising:

a first filter configured to produce an input signal $I(n)$ from a secondary audio program (SAP) signal;

a frequency modulator (FM) including,

a second filter that generates a quadrature-phase signal $Q(n)$ from the input signal $I(n)$,

a FM device configured to generate a frequency modulated signal $FM(n)$ from the input signal $I(n)$ and the quadrature-phase signal $Q(n)$, and

a third filter configured to produce the pulse code modulation (PCM) signal.

22. (new) The system of claim 21, wherein the $FM(n)$ signal equals $[I(n)Q'(n) - I'(n)Q(n)] / [I^2(n) + Q^2(n)]$.

23. (new) The system of claim 21, wherein the SAP signal is a constant magnitude signal, a sine wave, or a cosine wave.

24. (new) The system of claim 21, wherein the first filter is a band pass filter.

25. (new) The system of claim 21, wherein the second filter is a Hilbert filter.

26. (new) A FM demodulator, comprising:

a denominator device configured to receive an input signal $I(n)$ and a quadrature-phase signal $Q(n)$ to generate a signal $X(n)$;

a denominator calculation device configured to receive the $X(n)$ signal and generate a $Y(n)$ signal therefrom;

a numerator calculation device configured to receive the input signal $I(n)$ and the quadrature-phase signal $Q(n)$ and to generate numerator signal $Z(n)$ therefrom; and

a multiplier that is configured to multiply the $Y(n)$ signal and the $Z(n)$ signal to produce a $FM(n)$ signal.

27. (new) The FM demodulator of claim 26, wherein the $Y(n)$ signal equals $1/X(n)$.

28. (new) The FM demodulator of claim 26, wherein the $X(n)$ signal equals $I^2(n)+Q^2(n)$.

29. (new) The FM demodulator of claim 26, wherein the $Z(n)$ signal equals $[I(n)Q'(n)-I'(n)Q(n)]$.

30. (new) The FM demodulator of claim 26, wherein the $FM(n)$ signal equals $Y(n)Z(n)=1/X(n) * Z(n)=[1/ I^2(n)+Q^2(n)] * [I(n)Q'(n)-I'(n)Q(n)]$.

31. (new) A denominator calculating system, comprising:

a multiplication device configured to produce a first signal equal to $x(n)y(n-1)$;

a summation device configured to produce a second signal equal to $1 - x(n)y(n-1)$;

a multiplication device configured to produce a third signal equal to $(1 - x(n)y(n-1))a$; and

a summation device configured to produce a fourth signal equal to $y(n-1) + (1 - x(n)y(n-1))a$,

wherein n is a positive integer greater than or equal to 0,

wherein $x(n)$ equals $I^2(n) + Q^2(n)$,

wherein $y(n)$ equals $1/x(n)$,

wherein $I(n)$ equals an input signal,

wherein $Q(n)$ is a quadrature phase signal based on the input signal, and

wherein a is a scaling coefficient based on a transition speed of $X(n)$.